VEHICLE ADAPTABLE TO VARIOUS TERRAINS

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ABSTRACT

A vehicle is adaptable to various terrains. The vehicle includes a frame and two rolling sets connected to the frame. Each of the rolling sets includes two legs pivotally connected to the frame, two casters, a pin and a wheel. Each of the legs defines a slot. Each of the casters is connected to one of the legs. The pin is driven in the motor through the slots so that the motor is moved when the legs are pivoted. The wheel is operably connected to the motor so that the casters and the wheel always grip the ground firmly no matter the casters go up or down.
VEHICLE ADAPTABLE TO VARIOUS TERRAINS

BACKGROUND OF INVENTION

[0001] 1. Field of Invention

[0002] The present invention relates to vehicles and, more particularly, to a vehicle adaptable to various terrains.

[0003] 2. Related Prior Art

[0004] Various vehicles have been devised for diversified purposes such as transportation and recreation. The vehicles have become indispensable tools in modern societies.

[0005] However, driven on slopes, stairs or bumpy terrains or in short turns, most vehicles, if not all, have their centers of gravity lifted and in worst cases turn over. Some vehicles perform well on slopes, stairs or bumpy terrains. These vehicles generally include high profiles based on big wheels and high chassis. However, the high profiles mean heel or list in short turns. Some other vehicles perform well in short turns. These vehicles generally include low profiles based on low chassis. However, the low profiles mean bumping along the slopes, stairs or bumpy terrains.

[0006] The need for a vehicle that performs well in various conditions has not been satisfied. The present invention is intended to obviate or at least alleviate the problems encountered in prior art.

SUMMARY OF THE INVENTION

[0007] According to the present invention, a vehicle is adaptable to various terrains. The vehicle includes a frame and two rolling sets connected to the frame. Each of the rolling sets includes two legs pivotally connected to the frame, two casters, a pin and a wheel. Each of the legs defines a slot. Each of the casters is connected to one of the legs. The pin is driven in the motor through the slots so that the motor is moved when the legs are pivoted. The wheel is operably connected to the motor so that the wheel always grips the ground firmly no matter the casters go up or down.

[0008] The primary advantage of the vehicle of the present invention is that the casters and the wheel always grip the ground firmly no matter the casters go up or down.

[0009] Other advantages and features of the present invention will become more apparent from the detailed description referring to the drawings.

BRIEF DESCRIPTION OF DRAWINGS

[0010] The present invention will be described via detailed illustration of the preferred embodiment referring to the drawings.

[0011] FIG. 1 is an exploded view of a vehicle adjustable to various terrains according to the preferred embodiment of the present invention.

[0012] FIG. 2 is a perspective view of the vehicle shown in FIG. 1.

[0013] FIG. 3 is a side view of the vehicle shown in FIG. 2.

[0014] FIG. 4 is a side view of the vehicle shown in FIG. 3 on a plain surface.

[0015] FIG. 5 is a side view of the vehicle shown in FIG. 4 up a slope.

[0016] FIG. 6 is a side view of the vehicle shown in FIG. 4 down a slope.

[0017] FIG. 7 is a side view of the vehicle shown in FIG. 4 over a bump.

DETAILS OF DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] Referring to FIGS. 1 through 3, there is shown a vehicle adaptable to various terrains according to the preferred embodiment of the present invention. The vehicle includes a frame A and two rolling sets each installed on a side of the frame A.

[0019] The frame A includes two longitudinal bars A1, two crossbars A2 and a box A4. Each of the longitudinal bars A1 is formed with two pivots 10. A lug A3 is formed at each of the ends of one of the crossbars A2. Two lugs A5 are formed at each of the ends of the other crossbar A2. A seat or any other proper carriage can be installed on the frame A in order to carry personnel or goods. At least one battery can be put in the box A4.

[0020] Each of the rolling sets includes a support 21 pivotally connected to one of the crossbars A2, a motor 22 securely connected to the support 21, two legs 11 pivotally connected to the support 21, a caster 13 connected to each of the legs 11 and a wheel 23 operably connected to the motor 22.

[0021] The support 21 includes a pair of lugs 211 on the top, a lug 212 at an end and a lug 213 at an opposite end. The lug 212 is put between a pair of lugs A5. A pin (not shown) is fit in the lugs 212 and A5 so that the support 21 is pivotally connected to one of the crossbars A2. A spring 25 hooks the lug 213 at an end and hooks the lug A3 at an opposite end.

[0022] The motor 22 includes a power chamber 221, a transmission 222 operably connected to the power chamber 221 and an axle 223 operably connected to the transmission 222. The wheel 23 is connected to the axle 223. The motor 22 may be an electrical motor, an engine, a turbine or any proper power device.

[0023] Each of the legs 11 includes a bent configuration consisting of a short section 112 and a long section 115. An aperture 111 is defined in each of the legs 11 between the sections 112 and 115. The short section 112 of one of the legs 11 is formed with a lug 113. The short section 112 of the other lug 11 is formed with a pair of lugs 114. A slot 12 is defined in each of the lugs 113 and 114.

[0024] Each of the pivots 10 is fit in the aperture 111 of one of the legs 11 so that the legs 11 are pivotally connected to the frame A. The lug 113 is put between the lugs 114 that are put in the lugs 211. A pin 20 is fit in the lugs 211, 114 and 113. Because of the slots 12, the legs 11 can be pivoted relative to the frame A.

[0025] The operation and adapting of the vehicle to various terrains will be described referring to FIGS. 4 through 7. The description will be based on only one of the rolling sets.

[0026] Referring to FIG. 4, the vehicle goes on a plain surface. The weight of the vehicle is mainly carried on the
wheel 23. The axle 223 lifts the pin 20 and therefore the short sections 112 of the legs 11. Thus, the long sections 115 of the legs 11 are lowered so that the casters 13 are lowered onto the plain surface. The lower portions of the wheel 23 and the casters 13 are in a line. The heavier a load is on the frame A, the tighter the wheel 23 and the casters 13 contact the plain surface.

[0027] Referring to FIG. 5, the vehicle goes up a slope from the plain surface. The weight of the vehicle is mainly carried on the wheel 23 and the rear caster 13. As the front leg 11 is pivotally connected to the frame A, the front caster 13 goes up the slope when driven by means of the wheel 23, and the lifting of the front caster 13 will not entail the lifting of the wheel 23. The wheel 23 maintains its grip of the plain surface. The tilting of the vehicle is encountered by means of the rear caster 13 so that the vehicle will not tumble.

[0028] Referring to FIG. 6, the vehicle goes down a slope from the plain surface. The weight of the vehicle is mainly carried on the wheel 23 and the front caster 13. As the front leg 11 is pivotally connected to the frame A, the front caster 13 goes down the slope when driven by means of the wheel 23, and the lowering of the front caster 13 will not entail the lowering of the wheel 23. The wheel 23 maintains its grip of the plain surface. The tilting of the vehicle is encountered by means of the front caster 13 so that the vehicle will not tumble.

[0029] Referring to FIG. 7, the vehicle goes over a bump. The operation of the vehicle over the bump is like a combination of the operation of the vehicle described referring to FIG. 5 with the operation of the vehicle described referring to FIG. 6. When the front caster 13 goes up on the upside of the bump, the wheel 23 maintains its grip of the plain surface. When the front caster 13 goes down on the downside of the bump, the wheel 23 grips the upside of the bump. When the wheel 23 is on the bump, it grips the bump. Because of the spring 25, the casters 13 grip the plain surface.

[0030] The present invention has been described via detailed illustration of the preferred embodiment. Those skilled in the art can derive variations from the preferred embodiment without departing from the scope of the present invention. Therefore, the preferred embodiment shall not limit the scope of the present invention defined in the claims.

What is claimed is:

1. A vehicle adaptable to various terrains, the vehicle comprising a frame and two rolling sets each of which is connected to the frame and comprises:

   - two legs pivotally connected to the frame, each of the legs defining a slot;
   - two casters each connected to one of the legs;
   - a motor;
   - a pin driven in the motor through the slots so that the motor is moved when the legs are pivoted; and
   - a wheel operably connected to the motor so that the casters and the wheel always grip the ground firmly no matter that the casters go up or down.

2. The vehicle according to claim 1 wherein each of the legs comprises a first section in which the slot is defined and a second section to which the caster is connected.

3. The vehicle according to claim 2 wherein the first section is shorter than the second section.

4. The vehicle according to claim 2 wherein the first section extends from the second section at an obtuse angle.

5. The vehicle according to claim 2 wherein the frame comprises two pivots on each of two sides, wherein each of the legs defines an aperture for receiving one of the pivots so that the legs are pivotally connected to the frame.

6. The vehicle according to claim 1 wherein each of the rolling sets further comprises a support for connecting the motor to the frame.

7. The vehicle according to claim 6 wherein the support is movably connected to the frame.

8. The vehicle according to claim 7 wherein the support is pivotally connected to the frame.

9. The vehicle according to claim 8 wherein each of the rolling sets further comprises a spring installed between the support and the frame.

10. The vehicle according to claim 6 wherein the pin is driven in the support.

11. The vehicle according to claim 10 wherein the support comprises two lugs in which the pin is driven.

12. The vehicle according to claim 11 wherein each of the legs comprises at least one lug in which the slot is defined, wherein the lugs of the legs are put between the lugs of the support.

13. The vehicle according to claim 12 wherein first one of the legs comprises a lug while second one of the legs comprises two lugs between which the lug of the first leg is installed.

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